Spatial Mismatch: Understanding Differences in Income Mobility Between Cities

Introduction

A child born into the bottom quintile of income in Atlanta, Georgia is almost *three times* less likely to advance to the top quintile than his or her contemporary in San Jose, California. (Chetty et. al., 2014) While we often use simple heuristics to understand class in America – urban verses rural, Southern versus Northern – facts like this show that there are stark differences in socioeconomic opportunity even between superficially similar, "thriving" cities. This is due in large part to the lasting effects of urban planning decisions, which shape not only the physical form of the city but also its accessibility to the working poor.

One particularly important aspect of urban planning is the provision of public transportation. For many low-income individuals, faced daily with the challenges of securing a reliable commute and searching for work, economic mobility is necessarily tied to physical mobility through the city. An equitable, extensive public transit network can alleviate the many costs that the working poor face in this regard. Additionally, public transit can guide the spatial growth of cities, countering the highway-led urban sprawl that many US cities have faced.

For this and many other reasons, the accessibility of public transit is an important determinant of economic mobility in large cities. In this paper, I present a rigorous national test of the effect of public transit accessibility on upward income mobility. Before that, however, I make a conceptual case for the importance of public transit to studies of structural poverty. Finally, I conclude with some policy implications that follow from my study. My goal is to situate urban planning – and public transit provision in particular – within the broader context of a national conversation about economic inequality.

The Idea of Income Mobility

Inequality, broadly defined, has been a topic of great concern in recent American political discourse. Inequality scholars like Thomas Piketty - whose 2007 study of the US with Emmanuel Saez and subsequent book *Capital in the Twenty-First Century* both garnered considerable media attention - have seen their work elevated from public obscurity to a major political talking point over the last several years. This echoes a conceptual shift among American economists, who have historically downplayed or chosen not to study distributional issues - a stance against which many high-profile scholars have begun to break rank with the discipline.

It is in this fraught environment that Raj Chetty, Emmanuel Saez, Nathaniel Hendren, and Patrick Kline published their "Equality of Opportunity Project" papers, which provided the impetus for this study, in 2013. The Project comprises two papers, one of which addresses geographic differences in intergenerational income mobility across the United States, the other of which addresses long-term historical trends.

Income *mobility*, as a concept distinct from static *equality*, is of particular relevance to the US political conversation. Defenders of the US's uniquely skewed income distribution have often cited the wealth of opportunity available to its citizens as justification for its degree of income inequality. (e.g. Mankiw, 2013) In fact this supposed tradeoff is illusory – Alan Krueger (2012)'s famous "Great Gatsby curve" demonstrates that there is a strong positive correlation between equality and mobility – but it remains a potent rhetorical idea. That is why the Equality of Opportunity Project, which revealed vast disparities in income mobility *within* the US, struck a popular chord – it has been featured in the New York Times and cited by many city and state government leaders as a cause for concern. (ex. Reed, 2013)

Among Chetty et. al.'s most striking findings is a huge difference in mobility between the South and the rest of the nation: on average, individuals born into the bottom quartile of income in the southeastern states have only a 27%-38% chance of reaching a higher income level than their parents, a measure among the lowest in the nation. (Chetty et. al. refer to this statistic as "absolute upward mobility", and I will henceforth do the same.)

Equally striking and less intuitive to a casual observer is the degree of heterogeneity between cities: among the 50 largest metropolitan areas, absolute upward mobility varies from 46.2% in Salt Lake City, Utah to 35.8% in Charlotte, North Carolina. Urban differences do not map neatly onto a North/South divide, either – among the 10 least mobile cities are 3 in Ohio, one in Indiana, and one in Wisconsin. It is these sorts of differences which this paper seeks to explain.

After a brief survey of the literature on American income mobility that has preceded Chetty et. al., I will compare and contrast the prevailing explanations for disparities in income mobility found in the social sciences – particularly, the "individualist" explanations common in economics verses the "structuralist" arguments predominant in sociology. Then I will make a case for why geographic explanations of mobility – and access to transportation in particular – are a significant and relatively underexplored area of research. Finally, I will review some of the literature on how cities develop spatially, and how these conceptual frameworks – political and economic – can be applied to my case study of transit access in Columbus, Ohio.

Literature Review

Measuring Mobility

While Chetty et. al.'s study attracted popular attention, it was hardly the first of its kind, nor was it unique in its broad findings. Most contemporaneous is Graham and Sharkey (2013), which gathered survey measures of income from a selection of American cities and regressed log child income against log parent income to establish a measure of intergenerational mobility. This statistic is known as intergenerational elasticity, or IGE. This methodology has issues, however, as the relationship between parent and child income is non-linear, particularly around the upper and lower extremes of income, and thus varies with the local income distribution. Furthermore, Graham and Sharkey's findings are naturally limited by their lower sample size. In spite of these issues, their findings are broadly consistent with Chetty et. al.

Likewise, Aaronson and Mazumder (2008) and Justman and Krush (2013) find national estimates of income mobility comparable to Chetty et. al., in spite of some methodological differences. Chetty et. al. builds on these studies not only by offering a more detailed geographic picture of mobility, but by

improving on IGE as a metric. Instead of regressing log child income against log parent income, Chetty et. al. uses children and parents' *relative income ranks* within their respective birth cohorts in their regression specification. This yields linear, robust results, which is why I have chosen Chetty et. al. as my primary dataset for this paper.

A final note on measuring mobility: Chetty et. al. calculate two statistics based off their regression data. One is "absolute upward mobility", as described earlier, and the other is "relative mobility", which is the difference between outcomes of children in the top vs. bottom income levels of their cohort. The choice between these two statistics has both practical and normative implications, which will be discussed in the methodology section of this paper.

The Nature of Opportunity

If there is relative consensus on the level of income mobility in the United States, its determinants remain a much more complex and contentious subject. Factors as wide-ranging as school quality, neighborhood demographics, residential segregation, local cost of living and welfare policy have all been linked to mobility in some way. While I am narrowly concerned with the effects of spatial isolation (particularly lack of access to public transportation) on mobility in this paper, it is worth discussing the broader intellectual currents on the topic in order to justify my particular area of study.

Explanations of income mobility can be divided, broadly, into two camps: Individualist and structuralist. Individualist explanations predominate in economics, particularly in neoclassical economics and its modern methodological successors. When considering the determinants of income, neoclassical economists tend to emphasize "human capital" factors like skills and professional training, as well as individuals' incentives or disincentives to work. This focus on personal qualities in isolation comes from neoclassical economics' grounding in marginalist theory, in which wages are a function of individual workers' productivity. This has led many scholars of the American economy to posit a "skills mismatch" as the cause of intergenerational poverty (ex. Handel, 2005), citing that traditional manual labor-heavy jobs have been increasingly obsolete by globalization and deindustrialization, and arguing that better training for workers (present and future) is the key to ending persistent inequality of opportunity.

However, many scholars of poverty outside of the discipline of economics argue that economists' focus on methodological individualism elides important differences social, geographic, and political contexts that affect income. These so-called structuralists argue that economics presupposes a fixed set of background conditions in these areas that bear little resemblance to reality. Structuralist arguments are more common in sociology and political science – in the US, the "Chicago school" of urban sociology in particular has produced a number of influential strucutralist scholars of poverty.

Chief among these scholars is William Julius Wilson, whose work at University of Chicago in the 70s helped make its sociology department a metonym for the urban studies discipline. In *The Truly Disadvantaged,* one of his many books on the persistence of black poverty and neighborhood segregation, Wilson popularized the term "spatial mismatch" to characterize how many urban black communities are separated from work by geographic and social distance, not just a lack of professional skills. Throughout his work, Wilson refers to the mid-century emergence of a predominately black urban "underclass" created through systematic discrimination in housing policy and lending practices. This paper and many of the works cited therein owe a great deal to Wilson's articulation of these problems.

Many scholars have followed Wilson in exploring the spatial concentration of poverty and the physical separation of low-income individuals from employers. For instance, Kenneth Jackson's 1985 book *Crabgrass Frontier* provides a historical overview of the suburbanization of the American middle class and the coincident segregation of its black poor. Jackson argues that the United States is unique among developed nations in its sprawling metropolitan areas, the geographic distance between its poor and affluent neighborhoods, and its focus on private automobiles in transportation development – all products of public policy which can affect upward mobility.

Jackson's work deals mainly in historical narrative, but his claims have been reinforced through systematic studies. For instance, Jargowsky and Yang (2006) found that metropolitan areas that experienced a greater degree of suburbanization between the years 1990 and 2000 had a more persistent level of economic segregation. Similarly, Kasarda (1993) found that spatial concentration of poverty became greater from 1970 to 1990 on the national average, despite gains in a few Northeastern cities.

Likewise, Baum-Snow (2010) finds that there has been a population shift from cities to suburbs since the 1960s. However, he also observes that employment concentration is now *greater* in central cities than in the suburbs – in other words, the amount of jobs available in central cities has proportionately increased. Combining these two statistics, it becomes clear that fewer people today live *and* work in central cities, even as those areas become more productive. This suggests that the ability to commute long distances is becoming more important for workers, exacerbating spatial mismatch for those who neither have access to public transportation nor a reliable car.

Studies like this show that urban poverty can no longer be understood as a purely inner-city phenomenon, as in Wilson's time – Murphy (2007) points out that since the 90s, Census data has revealed an increase in suburban poverty, particularly in "inner-ring" suburbs proximate to cities. She points out that the phenomenon of suburban poverty has been largely overlooked by ethnographic and demographic studies, and stresses its importance to future poverty research.

While the nature of poverty may be shifting in some places, these papers all suggest that the social geography of cities – in particular, the concentration and separation of their poor – has a profound effect on job access and thus income mobility. In this area, there remains a disjuncture between economics and the rest of the social sciences. However, studies like Chetty et. al. have the potential to bridge this gap, as they allow social scientists to systematically test the claims made by sociologists and political scientists with a level of rigor and detail never before available.

Why Location Matters

If structuralist theories offer a compelling explanation of persistent poverty, the logical next question is: What sort of structures? What qualities common to cities like Columbus and Atlanta make them particularly inhospitable to the job-seeking poor?

There are a number of reasons why geographic location could affect income mobility. Most common in the literature are "neighborhood effects" like school quality, crime rates, prevalence of single parents, and a lack of supportive community institutions (a dearth of "social capital", to use Robert Putnam's term). Chetty et. al. find that all of these factors explain a significant portion of difference in income mobility. A similar but more qualitative explanation, popularized by Wilson in *When Work Disappears*¸ is that youth

in low-income neighborhoods suffer from a lack of positive social roles to which they can aspire, and are not socialized into the "soft skills" of communication and professionalism necessary for working life.

It is not my intent in this paper to judge the importance of these factors, which have been written about extensively. Instead, I am concerned with an explanation that Chetty et. al. do not rigorously test in their analysis: The physical separation from work caused by lack of access to reliable transportation.

To highlight why the omission of this factor is critical, consider the empirical literature on the spatial mismatch hypothesis, which is often ambiguous or conflicting. Hellerstein et. al. (2009) provide a good summary of the controversy: It is difficult to parse out the effect of spatial mismatch from the effects of hiring discrimination. As low-income urban communities in the US tend to be disproportionately black, these two phenomena are easily conflated. Many statistical strategies have been used to isolate the effect of spatial mismatch, but Hellerstein et. al. take a different approach: They stratify their sample by race before testing the spatial mismatch hypothesis. They find that the issue is not a simple lack of nearby jobs in low-income black communities; rather, it is that these jobs tend to be disproportionately held by whites, even when controlling for skill levels. When the sample is restricted to black respondents, the conventional spatial mismatch hypothesis appears to hold. This suggests a picture of racial inequality more complex than spatial mismatch or hiring discrimination *alone* – instead, the latter plays into the former.

This knowledge can help explain why place-based policy interventions like the Moving to Opportunity study (Katz et. al., 2001) and enterprise zones (Peters and Fisher, 2002) have appeared to have muted or nonexistent effects - while spatial mismatch may be a real phenomenon, it cannot be understood outside of larger patterns of discrimination. Looking at access to public transit is enlightening, then, as it is not only a determinant of social mobility in its own right but also a symptom of racial discrimination in urban planning and private development.

There are many mechanisms through which public transit accessibility can affect income mobility - it matters for more than just commutes. Harrison and Hill (1979) find that low-skilled "secondary sector" jobs tend to be considerably more cyclical than high-skilled "primary sector" jobs and subject to higher turnover. For this reason, low-income individuals (employed predominately in the secondary sector) face greater and more frequent search costs from looking for work, and these costs could be exacerbated through lack of access to reliable transportation. As they write, "Institutional obstacles to the free movement of workers from the secondary to the primary labor market seem to be deeply ingrained in American economic life."

Most of the empirical work on how public transit affects work access has been through case studies of particular cities rather than national surveys. For instance, Gao and Johnson (2009) use an econometric model of travel demand in Sacramento, California to estimate the potential welfare gains from expanding car ownership and making public transit more efficient. They find that while both interventions would increase low-income residents' welfare, public transit improvement would have broader benefits in terms of job accessibility and utility gains. Key to Gao and Johnston's findings is the fact that Sacramento's public transit system services both low-income and job-rich, high-income neighborhoods; this equitable access is a critical variable in my study.

Similarly, Sanchez (1999) compares the public transit systems of Portland and Atlanta and estimates the effect of transit accessibility on employment for both cities. Portland and Atlanta are interesting cases for the purposes of my study, as they not only lie on opposite ends of the income mobility spectrum, but have very different urban forms, political arrangements and racial compositions. Sanchez uses census block groups as his unit of analysis, and regresses unemployment statistics for each block on multiple measures of transit accessibility, as well as standard demographic covariates like racial composition and percentage of single parents. Sanchez includes three measures of transit accessibility: Service frequency, walking distance to the nearest transit stop, and a more sophisticated "gravity-based" measure of accessibility, in which a block is scored on its average distance from other blocks with service-sector employers, exponentially weighted. (The relative merits of these different measures, and how they might be synthesized, will be discussed in the methodology section.)

Sanchez finds that in Portland, only the walking distance measure has a significant relationship with employment, and the size of that relationship is small. Even this significance vanishes when the sample is limited to majority non-white census blocks. However, in Atlanta, he finds that all of the measures of accessibility except service frequency have a large, significant relationship with employment. What's more, he finds that bus accessibility has a much greater effect than rail accessibility in both cities, consistent with the majority of literature on this topic. He attributes the difference in findings between cities to the fact that in Portland, there is little variation in transit accessibility between census tracts (that is, transit access is relatively equitable), while in Atlanta there are large disparities between communities. As will be discussed in this study, the divergent development of public transit in these two cities can be explained in large part by their distinct bases of local political power.

In contrast to the studies above, Blumenberg and Manville (2004) is a direct challenge to Wilson's spatial mismatch thesis. Blumenberg and Manville are critical of the theory because they claim that it considers mere *distance* from jobs rather than *accessibility* of jobs – in many regions, as they test for in the paper, auto users face significantly shorter commutes than public transit users. They call this phenomenon "modal mismatch", and cite as its cause barriers to car ownership for low-income residents, like reliability and asset value limitations imposed on welfare recipients. They are skeptical of the effects of public transit expansion on employment, and point out that the same patterns of discrimination that have lead to residential segregation have also lead to the systematic under-serving of low-income groups by public transit. These admonitions are important to keep in mind for any study of how public transit affects the least advantaged.

Transit and Urban Sprawl

Blumenberg and Manville's paper is a reminder that transit issues should be considered in the broader social, economic and political context of urban development. The urban sprawl of an area, in particular, could have a great effect on the accessibility of jobs. There is clearly a connection between the nature of transportation (highway-led or public transit-led) and sprawl, but in what direction does causality run?

Baum-Snow (2010), mentioned earlier, ties sprawl to highway-led growth. He uses the amount of *planned* highways in 1960 as an instrument to explain employment decentralization and commuting patterns in 2000. He finds that expansion of the highway system has led to an outflow of residents from central cities, consistent with qualitative accounts of highway-oriented development like Jackson's.

However, some economists contend that physical barriers to construction matter more than any public policy. For instance, Saiz (2010) finds that the amount of buildable land in an area strongly affects the elasticity of its housing supply. In addition, he argues that legislative constraints on housing are in fact *endogenous* to physical constraints – they are simply a means for residents to protect the rents they have already acquired. Most importantly for this paper, he concludes that a lack of physical constraints on building leads to a greater degree of urban sprawl. This suggests, *contra* both Baum-Snow and Avent, that the initial geographic endowments of a city matter more for its expansion than any public policy could.

To untangle the direction of causality between transportation and land use, Levinson and Chen (2005) use a Markov chain model to study the co-evolution of highway networks and housing in the Twin Cities area from 1958 to 1990. They divide a map of the area into regular cells and classify each cell by its predominant use – employment, residential, mixed-use or agriculture –as well as its connection to the highway system. This yields 20 different types of cells. They then create a "transition matrix" for every type of cell, which estimates how likely it will be for a given type of cell to change into any other given type over the time period (in this case, a decade). They find that highway construction had an effect on the initial growth of the city, tending to make unpopulated agricultural areas into populated ones. However, they also find that the direction of causality is less clear for areas that are already urbanized.

In sum, the literature from economics suggests that public policy, especially the choice between highway- and public transit-led growth, affects urban sprawl. This is critical for my thesis, because if differences in transit accessibility were a mere byproduct of geography then there would not be many interesting policy implications to be drawn. However, the literature shows that accessibility is very much the product of human decisions, and that city development is historically contingent. How particular policies have shaped Columbus will be discussed more in this paper.

Understanding Urban Development Politics

Many of the studies on urban growth discussed thus far are from economists and are mostly or entirely quantitative in nature, with little attempt made to describe *why*, for instance, some cities built more highways in the 1960s than others. They also do not say anything about why certain neighborhoods receive public transit service while adjoining ones do not. Yet clearly these differences do not exist *sui generis;* they are the product of city, state and national political forces that cannot be separated from arid statistics. As urban sociologist Mario Small (2012) wrote in a piece on the Moving to Opportunity study,

> "Ethnographic studies should play a central role in the process of developing hypotheses, since hypotheses based strictly on theoretical reflection, rather than at least some empirical engagement, face the risk that anthropologists have long attributed to arm-chair theories: they generate expectations that, after the fact, appear to be obviously misguided."

With that in mind, here are some leading political accounts of urban development as it relates to public transportation. Note that since that since this is by nature a localized issue these studies are by no means meant to be comprehensive; consider them instead archetypes which this paper seeks to follow. I review three theories that may be useful in explaining Columbus. The first is classifying cities by their institutional priorities and the degree of "professionalization" among their public officials. The second is analyzing the influential voting and lobbying constituencies that support a given issue. The third and final is considering the elite coalitions that back a mayoral administration.

In the first category, Herm Boschken's "Social Class, Politics and Urban Markets" (2002) proposes a theory of how and why bias arises in public authority policy, using the transit authorities of a number of large cities as a test case. Boschken argues that economic cost-benefit analysis is a one-dimensional, unduly reductionist way of analyzing the efficacy of public policy, and proposes instead an analytic framework in which policies are evaluated on the basis of how they affect competing stakeholders. Boschken offers two axes on which to analyze public transportation policy: "Operational" vs. "social" goals and "effectiveness" vs. "efficiency" goals. Broadly, the former can be understood as differences in strategy – building the organization's prestige and eminence vs. serving political mandates – while the latter can be understood as differences in tactics – returning the maximum value to taxpayers vs. keeping costs to a minimum.

Boschken finds that regional transit authorities differ greatly on which of these goals they prioritize, and seeks to explain why by testing a number of demographic, institutional, and geographic hypotheses. His analysis uncovers a number of interesting patterns: First, emphasizing social goals necessarily means downplaying operational goals, and vice versa. Second, he finds that the strongest predictors of an organization's priorities are the degree of spatial centralization of the city and the fiscal autonomy of the agency. Centralized, congested cities tend to have socially effective but fiscally inefficient public transit policies (ex. New York City) while sprawling cities in which public transit agencies that are able to fund themselves (ex. Atlanta) prioritize their own solvency over serving disadvantaged populations. This suggests that the spatial form of cities matters to a great degree in shaping policy outcomes, and that the decision on the part of transit authorities to expand public transit to underserved groups rather than remain fiscally self-sustaining is best viewed as a political tradeoff.

Similarly, Terry Clark (1972) analyzes the degree of centralization in the leadership structure of a number of cities. He finds that cities with military installations, cities with a more "professionalized" leadership class and cities with fewer direct elections tend to have a more centralized elite. In contrast, cities with greater competition between political parties have a less centralized elite. Clark also distinguishes cities by their locus of power, broadly delineating "business" vs. "political" cities. He finds that cities with a business-minded elite tend to have more "reformist", technocratic governments.

In the second category, Lupo, Colocord and Foweler's *Rites of Way* (1971) is a comprehensive study of the Boston transit authority and how it was compelled to abort the construction of a highway in the late 60s due to protests led by residents across whose neighborhoods the proposed route would have cut. Through an exhaustive investigation into the Boston planning commission, Lupo et. al. uncover an institutional bias toward auto-focused transportation development and an insulation from political consequences and citizen feedback within the organization. Lupo et. al. conclude that the protests only succeeded because they enjoyed the backing of a wide variety of socioeconomic groups (as the proposed route would cut through both affluent and poor neighborhoods) and organized around a clear, oppositional goal.

Lupo et. al. then extend their findings in Boston to a national level, and argue that many cities face a similar disconnect between their municipal governments and their technically-minded planning organizations. They argue that no metropolitan area has a clearly articulated, agreed-upon development goal, and that in the absence of a strong political direction, planning commissions tend to have a bias toward the status quo when making decisions.

In the third category, Reed (1987) and Stone (1990)'s studies of development politics offer a model of how local power structures have influenced urban development in Atlanta that is useful for understanding other cities. Reed describes how the "reformist" administration of Atlanta's first black mayor, Maynard Jackson, downplayed distributional issues vis-à-vis "value-neutral" city development issues like the construction of a new airport in order to maintain a coalition with business community leaders. "There lies the means through which the Jackson administration reconciled the interests of the black citizenry with the business elite's development agenda," Reed writes, "by defining the latter *as the essential context for the fulfillment of the former*." [emphasis mine] Reed also posits that "caretaker" (reactionary) city movements do not need the institutional support that progressive movements do, a hypothesis supported by the success of "not in my backyard" protests like the one detailed in *Rites of Way.*

Stone analyses Atlanta's political structure from a comparative perspective, pointing out that Atlanta did not have the established city politics "machine" that many northern cities did - the first moderate mayor, Hartsfield, had to appeal to a broad group out of electoral necessity. The absence of machine politics had a dual effect – while it opened doors to black political incorporation, it also reduced the focus on class-minded policies. Stone argues that Atlanta's development has proceeded along technocratic lines, as the city has had a congruence of interests between its small but long-established black middle class and its white middle class. "Strategically important and co-optable black organizations and institutions were brought into the system of insider cooperation and negotiation," Stone writes, "but they came in largely as clients of white patrons." Stone argues that this institutional arrangement has shaped, among other things, the uneven development of Atlanta's rail and bus system, MARTA.

It should be noted that these areas of explanation span multiple levels of local government, including city governments, regional planning commissions and special-purpose authorities (such as transit authorities). This is intentional, as the delineation between these levels of government is by no means clear, and jurisdictional overlap is common. As Leigland (1994) points out in his study on public authorities, many of these special-purpose governments exist as vehicles for cities to finance spending, and can only be considered quasi-autonomous. What's more, studies like *Rites of Way* show that even when transit construction decisions are made by a technocratic body, they can be influenced by community action.

Rather than drawing a hard analytical distinction between levels of government based of their formal mandates, then, it is more informative to study local bases of power, as many of the sociological studies above do. Studies like these can be a valuable model for understanding power structures and institutional priorities in cities, and provide a necessary qualitative supplement to purely statistical accounts of urban development.

Methodology

Drawing from these sources and others, I posit that public transit access is a large factor in explaining differences in upward mobility between American cities. Furthermore, I believe that Chetty et. al.'s dataset allows this hypothesis to be tested in a more comprehensive and rigorous way than ever before, thanks to its scale, accuracy and longitudinal nature.

Chetty et. al. do not use states or counties as their unit of analysis – instead, they use a constructed area called the "commuting zone", created by Tolbert and Sizer (1996). Commuting zones (henceforth CZs) are meant to delineate areas by where the majority of the population works, and can be considered an

extension of the "standard metropolitan statistical area" methodology used by the Census Bureau to the entire United States, including rural areas. Tolbert and Sizer draw the boundaries of CZs by using hierarchical clustering analysis on Census data of individuals' commuting patterns. CZs are uniquely suitable for this paper, as I am concerned with transportation, so I follow Chetty et. al.'s example and use them as my geographic unit of analysis.

As mentioned earlier, Chetty et. al do include urban sprawl, as measured by the percentage of residents in a CZ with a commute greater than 15 minutes, as one of their explanatory variables in a regression on income mobility, and find it to be significant. While this is broadly supportive of my hypothesis, I aim to provide a deeper analysis, as Chetty et. al.'s commute length variable does not differentiate between automobile and public transit, and does not measure accessibility *per se*. A more sophisticated measure of transit accessibility is needed. I find such a measure in Berube et al (2011)'s study of the transit systems of the 100 largest metro areas in the US, and test its ability to explain income mobility using a number of regression specifications.

In addition, to supplement this study, I will present a political history of one city in particular: Columbus, Ohio, one of the least upwardly mobile cities in the US, and the second-largest to lack a rail network. **[cite]** While Columbus is far from representative of all the nation's large cities, it offers an interesting illustration of the fraught politics of public transportation and is comparatively under-studied. I will conduct primary source research on the political/social/legal history of public transit in Columbus, and briefly compare and contrast my work with similar studies done in other cities. Like Reed in *A Critique of Neo-Progressivism in Atlanta*, I aim to provide a high-level narrative account of the issue, rather than a focused investigation of one incident. My goal is to supplement the quantitative portion of this paper with an example of how local conditions can inform policy.

Design

To establish a relationship between transit accessibility and income mobility, I regress Chetty et. al. (2014)'s measure of absolute mobility against data on transit accessibility from Berube et. al. (2011) and a number of relevant controls. I then test this model for robustness to regional fixed effects and different specifications of accessibility.

It is clearly difficult to establish formal causality in this case - poor public transit may well be a symptom of economic stratification rather than a cause, or both may be the product of a third factor. What's more, the mere presence of a relationship between transit accessibility and mobility does not imply that alleviating structural inequality in cities is simply a matter of running more buses – we can only establish a high-level correlation between the two indicators.

These limitations are, I believe, inherent to comparative statistical studies, which is why I also explore the development of public transit in a particular city (Columbus), and the lived experience of those who use it. Consider the following regression a rhetorical framing device for the argument I seek to make, per McCloskey (1985)'s views on the goals of econometrics.

With these caveats, I hypothesize that an increase in the accessibility of public transit (as measured below) will lead to an increase in upward mobility for low-income individuals, all else being equal.

Data

Data on income mobility comes from Chetty et. al. (2014)'s national study of intergenerational mobility, as discussed earlier. Chetty et. al.'s data on parent and child income comes from dis-identified federal tax returns. Their measure is pre-tax, post-transfer and adjusted for cost of living using the CPI. In their paper on geographic differences, parents' income is taken from 1980 to '82, and their adult children's income from '96 to '00. This cohort of children was around 30 years old when their income was measured – Chetty et. al. establish that this is a robust, stable measure of their lifetime income through adding data from subsequent years to their specification.

As mentioned, Chetty et. al. construct two measures of income mobility from their tax return data – "relative" and "absolute" mobility. The former measures the difference in rank outcomes between children from bottom-income families vs. those from top-income families. This has ambiguous normative implications, as an increase in relative mobility – that is, a narrowing of the gap – could just as easily come from worsening outcomes for the rich as improving outcomes for the poor. (That said, the majority of difference in relative mobility between areas in Chetty's data comes from the lower- and middle-class; the rich appear to uniformly well-off.) Absolute mobility, in contrast, measures the expected rank outcome for children born into the 25^{th} percentile of income. Given that I am concerned foremost with the outcomes of low-income individuals, I use absolute mobility in my specification.

A final note on Chetty et. al.'s methodology: In constructing their CZ-level mobility estimates (the only level of data I have access to), they count individuals by their area of birth, not the area they end up in as adults. This decision likely stems from Chetty et. al.'s methodological focus on childhood effects (like school quality) in explaining mobility. This seems problematic for my purposes, as public transit access is just as likely to have a beneficial effect on adults as children, if not more likely. Yet if an individual moves from the country to the city as a young adult, they will not be counted toward the city in Chetty's data, leading to the potential underestimation of the effects of public transit on mobility. While this is a valid concern, Chetty et. al. check their data for robustness to migration by restricting their sample to non-movers, and find a strong correlation between their baseline mobility estimate and the restricted estimate (despite endogenous selection of non-movers). This means, in spite of the migration issue, I am comfortable using Chetty et. al.'s data for my regression.

Data on public transit accessibility comes from Berube et. al. (2011)'s study for the Brookings Institution. They study the transit systems of the 100 largest metropolitan areas of the United States. They construct three different measures of accessibility for each area – coverage, service frequency, and job access. In all cases, data on the extent of transit networks was taken from local transit agencies between 2009 and 2011. "Coverage" measures the percentage of census tracts within ¾ of a mile of a transit stop, this being considered a reasonable upper limit on commuters' acceptable walking distance. "Service frequency" measures the average time a commuter must wait for transit service during rush hour, averaged across all census tracts. Finally, "job access" measures the share of jobs than can be reached within 90 minutes using public transit, again averaged across all census tracts. Since these three metrics measure distinct aspects of accessibility, I include all of them in my regression.

For each metric, Berube et. al. provide four different versions. One is for all census tracts in the city, and the other three restrict the sample to low-, middle-, and high-average-income tracts, where low-income tracts have an average household income below 80% of the metropolitan area's median (AMI), middle-income tracts are between 80% and 120% of AMI , and high-income tracts are above 120% of AMI. I am

primarily interested in the low-income metrics, given my focus on absolute upward mobility, but I test my regression for robustness to using the universal metrics instead.

Berube et. al use standard metropolitan statistical areas (SMSAs) as their unit of analysis, rather than CZs like Chetty et. al. Fortunately, the two groupings map closely to one another – For CZs that intersect MSAs, the correlation between CZ-level and MSA-level mobility statistics is greater than 0.9. For that reason, I can safely combine the two datasets. However, a few transit systems that are treated as separate in Berube et. al. are covered by one CZ – in these cases, I average the accessibility metrics of the systems together, weighted by population, before combining the dataset.

Merged pairs and triads include Akron/Cleveland, New Haven/Bridgeport/Hartford, Ogden/Salt Lake City, Oxnard/Riverside/Los Angeles, Rochester/Buffalo, Stockton/San Francisco, and Worcester/Boston. Many of these cases are large cities paired with "satellite" communities that send more than a quarter of their workers to the main city (Berube et. al), so it is methodologically inconsequential for my purposes to merge them. After merging, n = 91.

Control variables include the fraction of black residents, racial segregation and income segregation indices, the fraction of residents with a commute < 15 minutes, local government expenditure per capita, and median household income. These variables are all taken from Chetty et. al.'s dataset, and details on their sources and construction can be found in Chetty et. al.'s documentation. I also include the percentage of Democratic votes cast in 1980 Presidential election as a proxy for the political ideology of each commuting zone during the time when parent income data was measured.

The commute time measure (meant to be a proxy for urban sprawl) is worth discussing in greater detail, as at first glance it may appear to measure essentially the same thing as Berube et. al.'s accessibility measures. However, commute time is not collinear with any of Berube et. al.'s measures, and this is because the two metrics are largely distinct – commute time captures both private automobile *and* public transit, and does not distinguish between local income strata as Berube et. al. does. As such, there is justification for including both in my regression. Berube et. al.'s accessibility measures should then capture the effect of access disparities (my variable of interest) *after* controlling for the effect of traffic congestion, slow rail systems, etc. That said, my results ultimately show that access disparities are necessarily tied to the factor of urban sprawl, as will be discussed in detail later. The two issues can never be fully separated empirically or theoretically.

Specification and Results

I estimate a regression of the form

$$\textbf{Relative mobility} = \beta_0 + \beta_1 \textbf{Job access} + \beta_2 \textbf{Coverage} + \beta_3 \textbf{Service frequency} + \beta \mathbf{X}$$

Where X is a vector of the control variables listed above. I test four different specifications of this model: With and without regional fixed effects and low-income vs. universal accessibility measures. For the regional fixed effects models, I code each observation by its official Census Bureau region: Northeast, Midwest, South, or West. This accounts for any differences between regions that are not specified in the model. I use clustered standard errors for the fixed effects model due to likely autocorrelation between geographically proximate observations. In all models, I weight observations by population to correct for heteroskedasticity. Note that all models are robust to restricting the accessibility measure to only one of

the three variables (“jobaccess”, “coverage”, or “servfreq” alone) – multicollinearity is not an issue. The results are reported in the following tables. (t-scores in parenthesis)

I. Regional FE, low-income accessibility measures:

	AM, 80-82 Cohort
%black	-15.480
	(5.35)*
Racial segregation index	-5.640
	(1.53)
Income segregation	7.304
	(0.33)
Fraction with commute <15min	-11.530
	(1.07)
HH income per capita	-0.000
	(0.40)
Local gvt. expenditure PC	0.743
	(1.40)
jobaccesslow	1.365
	(0.61)
coveragelow	4.209
	(4.66)*
servfreqlow	0.022
	(0.43)
%Votes Democrat, 1980 presidential election	-0.018
	(0.35)
Constant	41.922
	(6.04)**
R2	0.66
N	91

* p<0.05; ** p<0.01

II. Simple OLS, low-income accessibility measures:

	AM, 80-82 Cohort
%black	-17.401
	(4.15)**
Racial segregation index	-4.809
	(1.45)
Income segregation	7.206
	(0.44)
Fraction with commute <15min	-11.578
	(1.54)
HH income per capita	0.000
	(0.17)
Local gvt. expenditure PC	0.442
	(1.01)
jobaccesslow	1.739
	(0.70)
coveragelow	6.927
	(3.21)**
servfreqlow	0.043
	(0.90)
%Votes Democrat, 1980 presidential election	0.034
	(0.84)
Constant	37.052
	(8.08)**
R2	0.56
N	91

* p<0.05; ** p<0.01

III. Regional FE, universal accessibility measures:

	AM, 80-82 Cohort
%black	-14.376
	(5.64)*
Racial segregation index	-6.642
	(1.93)
Income segregation	12.824
	(0.55)
Fraction with commute <15min	-6.332
	(0.50)
HH income per capita	-0.000
	(0.19)
Local gvt. expenditure PC	0.383
	(0.87)
jobaccessall	1.491
	(0.45)
coverageall	5.680
	(3.92)*
servfreqall	0.012
	(0.35)
%Votes Democrat, 1980 presidential election	-0.014
	(0.32)
Constant	40.701
	(5.40)*
R2	0.70
N	91

* p<0.05; ** p<0.01

IV. Simple OLS, universal accessibility measures:

	AM, 80-82 Cohort
%black	-15.431
	(3.81)**
Racial segregation index	-4.979
	(1.60)
Income segregation	14.332
	(0.96)
Fraction with commute <15min	-5.305
	(0.70)
HH income per capita	0.000
	(0.69)
Local gvt. expenditure PC	-0.098
	(0.23)
jobaccessall	1.628
	(0.66)
coverageall	6.783
	(3.37)**
servfreqall	0.035
	(0.85)
%Votes Democrat, 1980 presidential election	0.041
	(1.11)
Constant	36.470
	(7.70)**
R2	0.59
N	91

* p<0.05; ** p<0.01

Interpretation

These results are broadly supportive of my hypothesis. Across all specifications, the "coverage" measure of accessibility has a large positive coefficient and is significant at p>.05. This suggests that, all else equal, cities that provide public transit to a greater proportion of residents tend to be more socially mobile.

However, there is another, less intuitive result: the "service frequency" and "job access" metrics are nowhere close to statistically significant, and have negligibly small coefficients. Given that all three variables purportedly measure accessibility, this is surprising. If anything, intuition suggests that job access should be *more* important than mere coverage; per Blumenberg and Manville (2004), the greatest physical barrier to employment that low-income city dwellers face would seem to be finding a way to get to work on time. What explains these contradictory findings?

There are two potential explanations. First, the service frequency and job access metrics are subordinate to the coverage metric; that is, they are only calculated for census tracts that are already considered "covered" (aka within ¾ of a mile of a transit stop). This means that the majority of significant variation is captured by the coverage metric. To put it another way: For most people, the issue does not appear to be whether they can catch the bus or train to work on time - rather, it is whether they have access to transit *at all.*

Second, the way in which Berube et. al. calculate their job access metric may skew the results. In the data provided, they do not differentiate between types of jobs; rather, they look at all employers within a 90 minute commute. Given that low-skilled service-sector jobs tend to be in the suburbs (cf. Jackson (1985), Kasarda (1993), Jargowsky and Yang (2006), and many others), this measure may overestimate the amount of *attainable* jobs that low-income individuals can reach via transit. Indeed, Berube et. al. note this disparity in their paper: "About one-quarter of jobs in low- and middle-skill industries are accessible via transit within 90 minutes for the typical metropolitan commuter, compared to one-third of jobs in high-skill industries." However, they do not provide detailed city-by-city data with which to test this explanation. This would be a fruitful area for further research.

A final caveat in interpreting these results: Since my sample only includes cities with a transit system, there is likely selection bias on the dependent variable. This makes results difficult to generalize beyond the sample. To correct for this bias, two-stage Heckman estimation could be used, in which a probit model for the likelihood of a city developing a transit system is first estimated, and then the result of this equation is incorporated into the income mobility OLS model. This use of Heckman correction is only valid if an exclusion restriction for the probit model can be found– in this case, a variable that is correlated with developing a transit system but not with income mobility. (cf. Bushway et. al. 2007) Use of historical instruments is common for this sort of problem in econometrics, ex. Baum-Snow (2010), which uses planned highways as an instrument for built highways, and Ananat (2011), which uses railroad tracks as an instrument for segregation. Unfortunately, finding such a variable for my data is outside the scope of this paper, but is another interesting subject for follow-up papers. Bus and commuter

rail networks have often developed along the path of early streetcar routes [cite], so the historical extent of streetcar routes may be a strong instrument in this case. There is precedent for this – Brooks (2014) uses streetcar networks as an instrument for modern urban sprawl.

Note that the use of Heckman correction assumes that all cities have the potential to develop a transit system – in other words, that having a transit network is a latent variable. Consider the most well-known use of Heckman correction, wage equations, in which it is assumed that there is some "reservation wage" (determined by personal characteristics) below which an individual will choose not to work. Selection bias caused by non-workers can then be treated as a case of omitted variable bias where the omitted variable is the reservation wage. However, it is not clear that there is anything analogous to the reservation wage in my case – it is odd to think that there is some threshold value beyond which a city chooses to develop a transit network. A better solution may be to use traditional two-stage least squares with streetcar extent (or whichever historical variable I find) as an instrument for transit accessibility in the first stage. In either case this is a promising route for further research.

In summary, transit accessibility does have a large, statistically significant effect on income mobility. However, it appears that the key aspect of accessibility is whether or not individuals can walk to a transit stop, rather than frequency of service or distance from jobs. This suggests that individuals without access to transit either live on the outskirts of or are systematically excluded from public infrastructure. While this finding deserves more rigorous study, it provides a useful way of framing the second question that this paper seeks to explore: Why is public transit more accessible in some cities than others? In other words, what political factors shape the social geography of the poor?

Case Study: Motivation and Outline

Columbus, Ohio is in many ways representative of the cities that prompted this study – it is among the least mobile urban areas in the nation, ranking 76th in absolute upward mobility out of the 91 metropolitan areas included in my national study. It is also the most populous city in the nation to lack a light rail system, in spite of decades of agency- and citizen-led attempts to expand public transit. This, I will argue, makes Columbus an archetypical example of medium-sized cities struggling to provide adequate access to work, in spite of its modest ranking (63rd out of 91) on Berube et. al's transit coverage measure. (I will discuss the qualitative limitations of this measure below.) Moreover, Columbus has faced many of the common urban growth issues – sprawl, residential segregation, and jurisdictional fragmentation - that have plagued most cities in the region.

Of course, like any city, Columbus also has idiosyncratic political and economic qualities – for instance, its historic lack of a large industrial base and its incorporation of its suburbs, both of which make it unique among Rust Belt cities. In the following section, I will attempt to parse out those institutional characteristics of Columbus that are common to other low-accessibility and low-mobility cities, and explain how they have shaped critical instances in the city's development.

I will present these critical instances in four sections: the initial growth of Columbus in the early 20th century, its highway-led expansion into the suburbs in the 50s, the creation of the Central Ohio Transit Agency and the Mid-Ohio Regional Planning Commission in the 70s (and with them the bus system), and finally, contemporary attempts to improve public transit through initiatives like light rail. In each section,

I will discuss how the events can be related to the theories of urban political economy discussed in the literature review, and present contrasting cases when needed.

I consider four potential explanations for the city's underdeveloped public transit: The presence or absence of cilentelist politics, the extent of organized citizen protest, the priorities of local government, and the resources given by state and federal government. Finally, I will discuss which of these theories presents the most compelling explanation for the city's underdevelopment, and what lessons can be drawn from Columbus's experience. I will argue that while the development of public transit is highly path-dependant, it can be redirected if there is broad-based popular support for better transit, few institutional veto points and sufficient finances on the local level.

Early Growth and the Great Migration

Columbus was, in many ways, a town that fell into its success. Despite its status as state capital, it remained a residential backwater for the majority of the 19th century, distinguished only by its connections to the railway system (which made it an overland shipping hub) and its state and federal government presence (which attracted a small professional class). Unlike its neighbors to the north, like Cleveland, Youngstown and Detroit, it lacked any sort of manufacturing base until the 1880s, when nascent iron and steel industries began to emerge. (Hunker, 2000) While heavy industry in Columbus never achieved the takeoff growth that it did in the rest of the Rust Belt, the city's central location, low wages and lack of organized labor initiatives made it a target for capital, and by the 1920s national firms like Ford had begun to set up shop.

At the same time, industrial development made Columbus a common site for black workers and families fleeing the South in what would be retrospectively known as the Great Migration. (Bryant, 1983) Again, Columbus's experience was more modest than its neighbors – its black population tripled from 1910 to 1930, compared to Cleveland's eightfold increase over the same period. Nonetheless, the Great Migration profoundly affected the city's residential character. Citizen violence and intimidation, restrictive lending covenants, gerrymandering of school districts and other quasi-legal forms of segregation helped to define the city's patchwork racial and economic geography, much of which persists to this day. The majority of black residents ended up in a handful of neighborhoods clustered around the High Street / Broad Street intersection in the center of the city, including Flytown, Franklinton, the Lower East Side and west of the Scioto River. Not coincidentally, these neighborhoods were both adjacent to factory pollution and distant from the city's white professional class, which was beginning to make its way north and east.

This white drift (which, for the time being, was confined to geographically contiguous neighborhoods) was aided by the city's aggressive annexation policy. Compared to other cities in the region, Columbus was unusual in its degree of suburban incorporation. Since neighboring communities depended on Columbus for utilities like water and sewer lines, the city government could make formal incorporation a precondition for the provision of these services. (Hunker) This *quid pro quo* expansion was aided by Ohio's constitutional code, which did not require the approval of a neighboring territory's landowners for city annexation, provided that the proposal was initiated by the territory's officials. While early annexation may seem like a legal curiosity, it had a profound effect on the city's midcentury development, as will be detailed later.

At the end of WWII, however, these early signs of expansion were not evident – Columbus still had little national standing or economic clout. Owing to this, the city never developed a clientelist political "machine" like those which dominated many industrial cities in the 19th and early 20th centuries, including Cleveland, Chicago and Philadelphia. While these cities were governed by political bosses who secured support via a personalist system of patronage, Columbus's leadership has always been characterized by a degree of professionalization. (Hunker)

Some scholars of urban politics, like Mollenkopf (1978), argue that machine politics, while undeniably corrupt, led to greater public-works investment than in cities with reformist mayors and city councils. Mollenkopf argues that reformist governments - concerned first with modernization and economic growth - tended to follow the interests of the local business community, forgoing the redistributive politics of party bosses in favor of a technocratic policy of attracting investment. Likewise, Clark (1972) finds that cities with business-friendly reformist governments tend to be more centralized and less responsive to citizen demands, holding fewer direct elections and spending less on public goods.

As an example of this phenomenon, Stone (1989) argues that Atlanta's underinvestment in and unequal provision of public transit is a direct result of the city's professionalized politics. The lack of ward-based patronage may have afforded Atlanta's black middle class the opportunity for political representation, he says, but it also required to them to do so on terms that were group-neutral and favorable to business investment. He quotes Andrew Young, the city's second black mayor, as saying that he could not "govern without the confidence of the business community". As a result, Atlanta's MARTA transit system was built along those routes which were most financially and politically feasible, avoiding many suburban communities entirely despite the outward shift of employers.

Can the "clientelism vs. reformism" lens help explain Columbus's public transit outcomes? Looking at the public transit systems of other large cities, it is not clear that this explanation is generalizable. Many of the cities with the most accessible public transit systems, including San Francisco, Los Angeles, Portland and Denver, also lack a lasting tradition of ward-based patronage politics. Moreover, the basis of the generous clientelist city vs. spendthrift reformist city dichotomy does not appear to be historically sound. As Lieberman (1998) details, there was in fact a *negative* relationship between per capita welfare payments and Black population percentage for other social programs like Aid to Dependent Children, even in the machine cities of the North. The presence of machine politics had a positive effect on welfare *coverage*, but not on substantive outcomes. Thus, this theory does not appear to be an instructive way to understand the politics of public transit (which is foremost a social program) either.

Reed and Stone's accounts of Atlanta might help explain that city's particular difficulties in securing substantive black political representation (and their arguments are much more nuanced than this clientelism vs. reformism story would suggest), but they cannot be applied to the whole universe of large-city cases. In fact, Columbus's public transit development did not take place in earnest until the 1970s, well after a national wave of municipal code reforms did away with the worst excesses of machine politics, even in places like Chicago and Philadelphia. To understand Columbus's underdevelopment in public transit, we must look nearer in history, toward the era of mass suburbanization.

A City Divided: Private Deed Restrictions and Highway Expansion

In the post-WWII period, Columbus would shift into the industries that would become its dominant economic force to this day: Banking, logistics, technical and medical research, and other highly skilled but ubiquitous industries. (Hunker) Paralleling this economic shift was a change in the residential character of the city, as the burgeoning middle- and upper-middle classes began to demand a new standard of living, characterized by single-family owned homes, large plots of land, and above all, distance from the inner city. With each successive wave of new developments, patterns of affluence in the city became more diffuse, as those who could afford it pulled up roots in the central city to move to neighborhoods like Upper Arlington, Bexley and Dublin.

The general outlines of this phenomenon of "white flight" – endemic to nearly every large American city – are well documented. What is less known is that in the case of Columbus, the self-segregation of the suburbs was driven primarily by the actions of private developers, not by restrictionary zoning laws. Indeed, it can be argued that from the policymaking perspective, Columbus's urban sprawl was not a sin of commission but of omission, of the acquiescence of city planners to the demands of real estate magnates and not -- as was the case in some (mainly Southern) cities -- the direct result of prejudiced policy. Regardless of its ultimate cause, the urban sprawl of Columbus had a profound effect on the city's transit choices.

Race-based restrictive covenants, which allowed landowners to deny the purchase and rental of properties to minorities as they saw fit, were legal in the United States until the 1948 Supreme Court decision of *Shelley v. Kramer*. Before then, however, developers in Columbus took full advantage of the practice. During the first real estate boom in the 1920s, more than two thirds of new subdivisions in the city had explicit racial prohibitions on ownership. (Burgess, 1994) This convention was most common in the wealthiest neighborhoods, like Worthington and Upper Arlington, which were entirely planned communities.

Restrictions on ownership were not always as nakedly prejudicial as racial covenants. More common were lower limits on property value and restrictions on constructing multi-family housing. While these types of restrictions certainly had legitimate applications, their effect on segregation by income and race was largely similar, perpetuating the residential divide. In fact, some restrictions were explicitly conceived as ways to circumvent *Shelley v. Kramer* – for instance, the communities planned by famous developer King Thompson, including Grandview and (once again) Upper Arlington, required membership in a "community association" as a condition of purchase. (Burgess) Prospective homebuyers had to receive the approval of a majority of the existing property owners – owners who, of course, tended to be overwhelmingly white and affluent. The result was a striking amount of continuity in the demographics of neighborhoods pre- and post- *Shelley v. Kramer.*

What to make of the city government's role in this process? In other cases, much has been made of the effect of zoning laws – rules enacted by city councils to dictate what sort of properties could be built on given plots of land – on *de facto* segregation. In Columbus, however, formal zoning laws largely *followed* the private restrictions imposed by developers, as in the case of Worthington, where the city directly adopted King Thompson's codes as its own following annexation of the subdivision. In this way the patterns of segregation imposed by the market were enshrined in law by the end of the 1950s. Around the same time, discriminatory lending by the Federal Housing Discrimination hastened the racial/class

division of the city. The neighborhoods that were "redlined" (deemed high lending risks) by the FHA remain among the most black and least affluent parts of the city today. (Burgess)

The adoption of zoning laws largely coincided with the city's annexation of the surrounding suburbs. As mentioned earlier, Columbus was proactive in its incorporation of new developments, extending the incentive of water and electricity lines in exchange for annexation. Many communities took the city's offer – in fact, some new developments were planned with the expectation that the city would soon absorb them. (Burgess)

To a large extent, the construction of Columbus's highways followed the caprice of developers as well. For instance, Route 315 was conceived as a way to connect Upper Arlington to the rest of the city. (Burgess) As Columbus's population grew in the late 50s and early 60s, this practice extended to the interstate highways as well – the routes of I-70 and I-270 largely followed residential patterns in the surrounding counties of Fairfield, Delaware and Madison, which are predominantly commuter suburbs (though not part of the city proper). In effect, these interstate routes have become *intracity* routes, with deleterious effects for inner-city residents – not only do these routes further urban sprawl, but they also cut straight through low-income neighborhoods like Franklinton, making pedestrian travel across them difficult or impossible.

Notably, Columbus's public school system did *not* expand along with the city's formal territory. Instead, school districts remained fragmented by neighborhood even as the inner-ring suburbs became part of the city proper. This unusual arrangement allowed the city to avoid the (often violent) backlash to *Brown vs. Board of Education*'s mandated school integration that visited cities like Boston in the 1970s. (Jacobs, 1998) In Boston, Louisville, Atlanta and elsewhere, busing cut across both white and black neighborhoods, leading to considerable white resistance. Columbus's civic and business leaders, fearing a situation like Boston's, recognized that busing had to proceed smoothly, for the city's sake – but their solution, allowing school districts to remain fragmented by community, effectively ran against the policy's intent while upholding the letter of the law. Their strategy also allowed the city to maintain its affluent tax base, unlike other cities where whites moved to nearby counties or townships in the wake of *Brown v. Board*. This is a key reason why Columbus never experienced any significant political or economic shakeups in its recent history. (Jacobs)

The sum of all these trends – suburban annexation, highway construction and the lack of school integration – is that mid-century Columbus secured economic stability at the cost of greater social goals. The city government has made an implicit pact with developers: It will keep Columbus's political and fiscal house in order in exchange for consistent, if unremarkable, economic growth.

Yet if Columbus's mid-century planning policy tended to follow private patterns of development, it was not the inevitable consequence thereof. It is true that the institutional decision-making structure of planning is usually unidirectional – funds flow from federal and state budgets to local agencies, which are free to act but are only given a narrow technical mandate. This tends to lead to projects that preserve the economic status quo, as in the case of Columbus. However, there are many well-documented instances of communities successfully campaigning against plans, especially in cases of highway building, which can cleave neighborhoods in two. Why were the residents of Columbus never able to mount a successful anti-sprawl campaign? To answer this question, it is again helpful to consider a counterfactual – in this case, Boston in the 1960s.

In 1966, a broad coalition of citizen interest groups – representing everyone from planning experts to clergy, university faculty to real estate agents, low-income black and immigrant neighborhoods to affluent suburbs – would successfully campaign the Massachusetts governor to block a proposed expansion of the I-95 highway that would have split the city from east to west. The specifics of this campaign, meticulously narrated in Lupo, Colocord and Fowler's *Rites of Way*, are beyond the scope of this paper, but it is worth looking at what Lupo et. al. identify as the key aspects that made it successful.

First and foremost, the campaign enjoyed the support of a truly wide variety of groups, not just in terms of income or demographics but in terms of expertise and access. The campaign was spearheaded by a group of nonprofit planning consultants who were able to identify the state Department of Public Works' automobile-biased methods of forecasting transit demand as an issue in the first place, and then debate it on its own terms. Likewise, the support of civil society organizations like churches and suburban community was critical, eventually leading the mayor of Boston to put his support behind the campaign and make it a national issue.

Additionally, the residents of the Boston area already had a well-established alternative to highway expansion that they could point toward – the commuter rail system of the Massachusetts Bay Transit Authority. The guiding rhetoric of the campaign was that the state highway planning process failed to take into account the alternate modes of transit already used by the community.

Finally, the campaign was able to make the highway expansion into a politically unavoidable issue for the Massachusetts governor. This is due in part to the timing of the campaign around an election year, but also to a concerted effort to bring highway expansion into the debate through media campaigns and journalistic attention. Boston has always exerted an outsize influence on the state politics of Massachusetts, a fact that organizers were able to exploit to their advantage. They made what was previously considered a technocratic issue into a political one.

Columbus faced no such inflection point in its urban development. The expansion of its highways only disrupted those neighborhoods least able to mount a protest. This stands in contrast to the case of Boston, where the I-95 expansion threatened established, affluent communities like Cambridge. In Columbus, the new routes did not cut through venerable suburbs, instead running out to rural areas in the east and northwest that had just begun the transition away from farmland. Furthermore, there was no confluence of civil society groups that stood up to oppose this, no independent planning experts to point out the harm in its long-term implications.

Most importantly, the timing of Columbus's development relative to the federal push for highway construction could not have been less favorable to public transit. While Boston had already been developing its commuter rail system for several decades, Columbus had not even established a transit agency by the time of the first great federal investment in highways. (Hunker)

In sum, the modal choice of a city – the split between public transit and highways - is both politically contingent and highly dependent on its existing path of development. In both areas, Columbus faced a "perfect storm" of factors that made transit-oriented development in the mid-century infeasible.

However, even some relatively late-blooming cities – like Portland – were able to make sprawl prevention and transit-led growth a successful part of their development agenda. While Columbus certainly had the

deck stacked against transit during its first period of growth, this is not a sufficient explanation for its contemporary transit outcomes.

The Creation of COTA and the Revival of Columbus

If Columbus's small industrial economy meant that it never saw the heights of productivity – and attendant inequality – that its Rust Belt neighbors did in the first half of the 20th century, it also meant that the city was able to bear the effects of deindustrialization in the 60s and 70s more gracefully. Most heavy industries in Columbus did in fact wither or leave the city during the time, but this was less a reversal in the direction of its economy than the acceleration of an existing trend - only 30 percent of Columbus workers were employed in manufacturing in 1960, declining steadily to 11 percent by 2000. (Hunker)

The city came to specialize further in services during this time, as nationally-known hospitals, retail headquarters and banks (among others) sited downtown. This growth more than offset industrial losses, leading some to declare Columbus "recession proof" – an assertion that would be challenged at the turn of the next century, but at the time seemed indisputable.

It was in this optimistic environment that the city decided to purchase a fleet of buses run by the Columbus and Southern Ohio Electric Company and found COTA, the Central Ohio Transit Authority. Despite its name, COTA only serves the city proper (and the townships within it), and does not run out to the surrounding counties. This is why, as mentioned in the introduction, Berube et. al.'s measure of transit coverage overestimates Columbus's accessibility to inner-city workers – although there is significant economic activity in Columbus's suburbs, they are not included in the calculation of coverage due to their complete lack of transit service.

If the entire Columbus Metropolitan Statistical Area was included in Berube et. al.'s estimation, the city would look much less accessible. In fact, looking nationally, most of the difference in accessibility appears to come from the lack of connections between low- and high-income areas: If the sample is restricted to low-income census tracts alone, most cities score well on accessibility, aside from a few exceptionally poor cases like Atlanta. This further illustrates that like most cities, Columbus is split between affluent auto-reliant suburbs and a struggling transit-reliant urban core.

To illustrate the disparities in COTA service: Only one bus runs out to the nearby affluent communities of Dublin and Hilliard, found to the west of Columbus proper. The same is true of equally prosperous Westerville and Canal Winchester to the east, and Pickerington, one of the fastest-growing (and highest-median-income) suburbs, is not serviced at all by COTA. Boschmann (2011) demonstrates how these disparities affect job access in his study of the commuting patterns of the working poor in Columbus. He found that a majority of the respondents he surveyed had been offered or knew of better-paying service jobs in the surrounding suburbs, but had no practical way of getting to them. In the most dramatic cases, some of Boschmann's respondents were forced to adopt "extreme commutes" of more than two hours one way in order to get to work on time, or relied on taxicabs at great personal expense.

The first COTA routes followed a circuit more than century old, first traversed by streetcars in the mid-19th century. Along a path that used to connect bustling cross-street markets to residential areas in the north and south, a bus now served an almost entirely low-income population in the old city. (Blanchard,

1922) While there have been some tentative expansions into the north and east since the 70s, the main COTA routes of today remain the same. Nearly all of Columbus' white-collar professional class, and indeed the city's workforce as a whole, drive to work – 2011 estimates put COTA's ridership at a mere 2.3 percent of the metropolitan working population. (Boschmann) Comparatively speaking, Columbus ranks 42nd on transit ridership rates out of the 50 largest metropolitan areas of the US.

However, transit efforts did not stop with COTA. In light of Columbus's residential sprawl and the increased need for inter-county coordination on infrastructure projects, the Mid-Ohio Regional Planning Commission was formed in 1960s, encompassing most of the counties in Columbus's standard metropolitan statistical area. MORPC is responsible for allocating federal money for transit and other infrastructure projects. While it cannot act without a majority vote from its member governments (the 15 county governments of the greater Columbus area), it still exerts a significant amount of influence over the region's policy priorities, acting more like an autonomous quasi-governmental body than a purely technical agency.

Regional bodies like MORPC often use their fiscal authority to spearhead public transit projects on their own, rather than waiting for a legislative mandate. Is Columbus's lack of accessible transit a product of MORPC's institutional priorities? Boschken argues that public agencies can be understood as holding one of four mutually exclusive goals: Organizational effectiveness (increasing public standing and budget), operational efficiency (maintaining fiscal and technical stability), social-program effectiveness (serving a broader goal like aiding the poor) and reciprocal effectiveness (giving the best value to the biggest taxpayers). Boschken uses factor analysis to determine which local institutional/political/economic characteristics can predict an agency's priorities.

The sum of his results is that cities can be broadly grouped into two types: Centralized, congested cities with socially effective but fiscally inefficient transit systems (e.g. New York City), and sprawling cities with transit systems that are fiscally autonomous but do not serve a social end. He also finds that agencies that prioritize social effectiveness tend to come from cities with a large upper-middle class. Boshken posits that this is due to the prevalence of an upper-middle-class "genre" in those cities – essentially, a set of technocratic norms and values that informs policymaking. He believes that holding UMC values lead transit agencies to focus more on social goals – as long as public transit is not in policymakers' backyards.

To the extent that Boschken does not simply reiterate the previous discussion on the importance of urban sprawl, his findings are worth considering. Columbus does not easily fit into his framework. For one thing, its transit system is certainly not fiscally autonomous – about half of its funding comes from the state's general revenue fund, which is temporary and politically contingent. (Nationally, the average transit system receives only 25% of its operating funds from the state. (ODOT, 2015)) Moreover, under current law, MORPC's federal dollars can only be allocated toward new capital projects rather than upkeep costs, which comprise most of the lifetime cost of transit systems. (ODOT)

As for the upper-middle-class explanation, it is not clear how Boschken thinks that the UMC "genre" actually influences agency policies. Nonetheless, if we follow him in using income statistics as a proxy for the prevalence of the UMC, it is obvious that Columbus is not exceptional in this regard. About 20% of Columbus's population is in the 4th national quintile of income – the same as the overall national average. This variable should not have much influence over outcomes one way or the other, then.

Finally, there is the question of the dependent variable in Boschken's study - anecdotal observation suggests that MORPC does *not* suffer from a lack of institutional will (or at least desire) to expand service to the least advantaged. The agency constantly lobbies the state and federal governments for more flexible transit funding, consults community and advocacy groups when planning new projects, and is the region's leading advocate for sprawl-limiting, public transit-led "smart growth" policies. As one of the few self-described progressive groups active in local policy-making, MORPC wears its social priorities on its sleeve. (Personal correspondence, 2015)

A better explanation is to look at institutional veto points *within* MORPC. As mentioned, MORPC only operates with the consent of its constituent governments; its director can propose initiatives but is ultimately constrained by the voting process. This can allow the parochial interests of individual counties and townships to prevail over agency priorities, as demonstrated by a recent controversy over a proposed change to the state's local government revenue-sharing formula. A proposed amendment to Ohio's 2016 state budget would have allocated revenue-sharing funds away from municipalities and toward townships and villages. Representatives of the city of Columbus and its resident county (Franklin) expressed opposition to this measure in MORPC meetings, but could not get a majority of member governments to support them in condemning it. This is because MORPC's "one member, one vote" rule effectively over-represents small rural governments. A similar dynamic plays out in transport funding allocation debates (MORPC's primary responsibility): outlying counties have been slow to put their support behind expansion projects that would provide little direct benefit to their (mainly suburban, mainly affluent) populations. (Personal correspondence, 2015)

It is instructive to contrast MORPC with the Portland area's regional planning body, simply known as Metro. Metro's council members are democratically elected and can hold no other political appointments. It also has home rule authority under the Oregon state constitution, which allows it to preempt city and county governments in all matters of "metropolitan concern". Furthermore, Metro's efforts to manage growth in the Portland region are explicitly supported by state law: Oregon's Senate Bill 100 requires all cities to establish an "urban growth boundary" and maintain a long-range land use plan. (Freire and Stren, 2001)

Notably, unlike MORPC, Metro has enjoyed relative harmony between its constituent governments. This is largely because both urban and neighboring rural counties in the Portland region benefit from the urban growth boundary – Portland is surrounded by farmland, which has historically formed a significant part of the state's economy. When iconoclastic governor Tom McCall led the effort to pass Senate Bill 100 in 1973, he was able to take advantage of a confluence of interests between urban and rural representatives on the matter of controlling growth. (Freire and Stren) As a result of this institutional arrangement, the city of Portland has had a much more activist, forward-looking development agenda than most cities in the US. This is possible because Metro has significantly fewer institutional veto points than MORPC.

The institutional structure of public agencies, then, clearly has an effect on public transit outcomes. In order to understand the obstacles to institutional reform and stable transit funding, we must consider two final pieces of the policy puzzle: the state legislature and mayor's office. A survey of recent (failed) efforts to expand public transit service in Columbus will be illustrative here.

Paved With Good Intentions: Contemporary Public Transit Initiatives

In the last three decades, city leaders have recognized the great potential benefits of growth management and transit-oriented development. A number of proposals, including calls for streetcars, light rail or bus rapid transit, have been put forward by COTA, MORPC and the mayor's office, but none have managed to gain traction. This is due to three large fiscal obstacles: the conditionality of federal funding, anemic state support and the lack of local revenue-raising powers. Because of these constraints, transit projects have had to rely on either sales tax referenda and/or private investment for funding, and both sources have proven unreliable. I will explore how these constraints shaped the outcome of a number of failed transit expansion initiatives over the last three decades.

One of the first campaigns for transit expansion came in the early 1980s, when COTA unveiled its "Transit80+" plan, which promised not only improvements to the existing service but a light rail starter line. However, this plan not only failed to inspire public support, but would have been fiscally impossible – the local sales tax levy that was meant to fund it expired in '84. (Gibson, 2015) This did not stop COTA from persistently lobbying for light rail in its subsequent plans, even proposing a downtown monorail in '87. However, these demands were made with the implicit recognition that they would not be met any time soon – in '89, another levy had to be passed just to keep COTA's existing bus service running.

In the early '90s, Columbus's opportunity to host the international AmeriFlora conference – which brought an unprecedented influx of visitors – prompted more calls for a light rail system, this time led by MORPC. The mid-'90s plan enjoyed more public support than previous efforts, but political and business elites balked at the large-scale restructuring of downtown zoning that the plan – centered around what would instead become the Columbus Convention Center – would require. Additionally, a levy to fund the plan died in the planning phase in '95, and a levy to simply increase COTA's bus service was voted down. (Personal correspondence, 2015)

A shot at redemption for rail advocates came in '98, when the federal legislature passed an infrastructure bill that provided, for the first time in decades, federal funding for public transit. The plan, tied to the Clinton administration's welfare reform efforts, could have funded the capital costs of a Columbus light rail system – however, the city lacked an active transit plan that included light rail, and so the funds went unclaimed. (Gibson, 2015)

Further struggles with securing federal funding came in the early 2000s, when COTA attempted to fund yet another light rail project – this time dubbed the North Corridor Line – through the Federal Transit Administration's New Starts capital investment program. However, the stringent conditions of New Starts made this project a non-starter – not only was the city unable to secure the 50% matching funds required by the FTA, but the North Corridor Line received middling evaluations of its justification and land-use feasibility, which ultimately led to its demise.

Even a decidedly more modest attempt to create a streetcar route from the Ohio State University area to German Village in the late 2000s met with the same objections from the FTA and has been shelved indefinitely. Since then, there have been no new mass transit projects proposed for the region, save the ever-present idea of a Columbus to Chicago high-speed rail line, which has been in "early talks" for nearly two decades (and bears little relevance to the accessibility issues discussed in this paper).

Light rail initiatives have not suffered from a lack of city government support, at least in word. The mayor's office has consistently advocated for the expansion of the transit system, including it in the city's

strategic plans since the early 90s. (Columbus, 1993) Indeed, incumbent mayor Michael Coleman has been a vocal supporter of light rail since his City Council days, when as a young advocate he argued that a robust transit system could make Columbus the next Toronto (Bryant, 1994) – a connected, cosmopolitan city. However, as the case of MORPC's failed '90s light rail plan demonstrates, elite support for transit has been predicated on its alignment with the business community's larger development priorities, and this has constrained the actions of the city administration. As MORPC's proposed route directly conflicted with Mayor Lashutka's designs for a downtown Arena District and convention center, it received little elite interest, and the plan was ultimately scrapped. (Gibson, 2015)

Popular support for transit has been similarly ambivalent. As mentioned, levies to fund the existing COTA bus system have received lukewarm support at best, likely due to the system's low ridership rates - especially among middle-class voters. However, light rail has polled considerably better – a 2007 poll from *Business First* found that 68% of respondents supported the streetcar proposal that was in talks at the time, "largely based on [Mayor Coleman's] pledge of no additional taxes to support the plan"**.** Likewise, a 2014 online poll conducted by OSU found that 96% of respondents supported the creation of a light rail system (Gibson, 2015) – however, the poll made no qualifications about financing and, like all online polls, likely suffered from significant selection bias. Nonetheless, it seems like a majority of Columbus residents support transit improvement in principle – but response at the ballot box has been more conflicted.

There has only been one local ballot initiative explicitly related to rail: A 1999 proposal for a sales tax increase to fund both rail *and* bus expansion. This initiative was split into two parts, one permanent and one temporary, and only the permanent levy passed**.** State development officials suggest the complexity of the two-part ballot question like contributed to this ambiguous result, and note that there has never been an *outright* defeat of light rail at the polls. (Personal correspondence, 2015) In sum, while there has never been an overwhelming popular mandate for public transit expansion, the public seems on balance to support it, especially when it promises to bring investment to outlying communities, as is the case with light rail.

In the absence of a strong public mandate one way or the other, what can explain the consistent failure of Columbus's public transit initiatives? Here, Reed and Stone's analyses of progressive reform politics in Atlanta may offer a guide. If Columbus's economic stratification was driven by racial animus, Atlanta faced a set of segregationist pressures many times stronger, and yet has boasted an unparalleled level of black political incorporation - even without the crutch of machine politics. Stone argues that this was only possible due to a congruence of interests between the city's well-established black middle class and local (predominately white) business interests - as he puts it,

> "Strategically important and co-optable black organizations and institutions were brought into the system of insider cooperation and negotiation, but they came in largely as clients of white patrons."

This, Stone contends, constrained the ability of city executives to effect truly progressive policies. This manifested in the form of lukewarm enforcement of school desegregation in the '60s, not unlike in Columbus – in both cases, city administration supported busing as an outward expression of their cosmopolitanism, but dared not pursue it to the extent that it would have incited tension and threatened the local investment climate. Instead, they pursued half-measures that assuaged popular fears on both

sides without effecting the actual racial composition of schools to a great degree. Similarly, Reed argues that Atlanta's business development agenda became the "essential context" for the fulfillment of black political demands, constraining the mayor's influence over key economic decisions like where to site the city's massive Hartsfield-Jackson airport. Its ultimate location in Clayton County (the far south end of the city) was a symbolic concession to Atlanta's black community but meant little in terms of employment outcomes or access.

Columbus has - on a smaller scale - faced the same tension between a progressive black administration and the established business community, resolved through the moderation of the mayor's demands. However, while this tension may help explain certain recent incidents in the city's development, it is not a sufficient explanation for its long-standing lack of investment in public transit. With the exception of the failed MORPC rail plan mentioned earlier, most of the obstacles to transit development in the city have come not from internal pressures but from external veto points: The authority of neighboring counties over planning and zoning (as discussed earlier), and the fiscal authority reserved by the state government.

In the latter area, the city of Columbus is constrained in its ability to raise money for capital projects due to its lack of taxation options. Sales tax levies are the most expedient way for the city to fund projects, but these levies are subject to a referendum and are often time-limited**.** As COTA's experience demonstrates, it is difficult for service provider to remain financially sustainable when funded predominately through levies.

Unlike some states, Ohio allows its cities to collect their own income taxes as well. Columbus does not suffer from a lack of resources in this area – its incorporation of the surrounding suburbs (but without school integration, as mentioned) allowed it to avoid the worst consequences of the income tax drain that accompanied the "white flight" across US cities in the '70s. However, none of the city's income tax goes toward funding COTA. (ODOT) The same is true of the city's property tax. That said, Columbus is not unusual in this regard – nearly all of the largest cities in the US do not use income or property taxes to fund their public transit systems, due in large part to a desire to remain "competitive" by keeping taxes on residents low. We must look for fiscal variation elsewhere.

To supplement conventional taxation options, some cities, like Dallas, Seattle and Portland, have funded public transit projects through a scheme known as "exactions" or "value capture" (Wise, 2010), in which cities offer land to developers on a financial condition – either direct payments to city government or in-kind payments through infrastructure construction. Exactions are a favored fund-raising strategy for local governments, as they are more politically feasible than broad-based taxes and are directly tied to specific projects.

However, exactions have faced challenges under Ohio law. There is nothing in the Ohio Revised Code specifically dealing with the subject, but a limited precedent has been established through several Ohio Supreme Court cases. On multiple occasions, the Court has ruled that exactions are permissible under "home rule" statutes if and *only* if they are used to directly fund developers' public service costs - as in the case of water and sewer usage fees - and are no higher than the cost of service. (Johnson, 2008) This gives Ohio cities little ability to raise money for longer-term capital projects, like public transit.

Columbus also faces strict limits and conditions on federal and state infrastructure funding, but this is the case for the vast majority of US cities, so it cannot explain why Columbus in particular has struggled to

develop a strong transit system. However, the state has influenced Columbus's sprawl and uneven development in a less direct way: Corporate development incentives aimed at low-tax counties. For instance, Honda chose to open their first American manufacturing plant in Union County, a rural area adjacent to Columbus's Franklin County, due to the influence of the state Department of Development. State officials negotiated the deal without any input from local authorities, and essentially dictated the tax terms on which the Union County commissioners were to accept the investment. (Personal correspondence, 2015) This unilateral approach to economic development accelerated the sprawl of the Columbus metropolitan region, and many social workers and nonprofits from the area have described lack of reliable transportation to jobs as one of the largest obstacles their low-income clients face. (Personal correspondence, 2015)

In sum, the biggest contemporary problems with public transit projects in Columbus are a lack of revenue-raising options, insufficient popular and elite support, and confounding mandates from the state government.

Conclusion

It is difficult to single out one historical factor to explain Columbus's underdevelopment of public transit, because in many ways the city has faced a "perfect storm" of confounding influences. Other cities had a lack of geographical constraints on expansion during their early history. Other cities (in fact, nearly all large cities in the US) adopted segregationist zoning laws in the early 20th century. Other cities have faced financial and legal problems when attempting to raise money for public transit improvements. However, as the counterfactuals explored in my case study demonstrate, none of these factors on their own is sufficient to explain Columbus's outcomes. Rather, the answer lies in their confluence: An early pattern of uneven, exclusionary growth has been *solidified* by modern laws that put institutional stumbling blocks in the way of the rezoning and local financing that transit improvement would require. A poor public transit system, in turn, discourages widespread ridership and ensures that middle-class voters and business elites come to see new transit proposals as a waste of money.

In other words, uneven development and low public opinion of transit become a viscous cycle, enabled by certain legal institutions – namely, county/township veto power over development plans and state constraints on municipal fundraising.

What generalizable lessons can be drawn from the case of Columbus? Given the highly decentralized nature of local governance in the US and the fact that my account rests heavily on the particular legal environment of Ohio, it may at first appear difficult to make any broader inferences. However, using the data from my quantitative analysis, I show that Columbus shares a number of relevant demographic characteristics with other low-accessibility cities – and that as a result, these cities likely share similar institutional obstacles to public transit development as well. What follows is a limited national analysis that would be a good starting point for future papers.

I want to figure out if low-mobility cities like Columbus belong to a certain basic "type"; that is, if they share a certain combination of explanatory characteristics. To determine this, I use factor analysis to calculate which orthogonal combinations of variables most effectively capture the variance of the data. Three main factors emerge (full output in appendix); these correspond roughly to the three basic types of cities that I describe below.

First, there are cities that have low income mobility, a large proportion of black residents, a high degree of racial segregation and low transit accessibility. These cities tend to be in the South, e.g. Atlanta, New Orleans, and Charlotte. Second, there are cities that have high income mobility, a relatively small black population and high transit accessibility. The large Pacific Northwest cities (ex. Portland and Seattle) fall into this type, as well as San Francisco. Third and finally, there are those that have moderate income mobility, a fairly large black population (but less than type 1), high segregation and high transit accessibility. Only a few of the largest cities, including New York and Chicago, fall into this type. (Factor 3 in the output can be thought of as "correcting" the underlying pattern for these few cases.)

The key to understanding Columbus (and most other cities in the Midwest) is that, in terms of this typology, *it most closely resembles the "Sun Belt" cities of the South, not its post-industrial neighbors in the East*. The similarities go beyond these demographic characteristics. Like the Sun Belt, Columbus did not develop in earnest until the mid-20th century, and its ascent was due largely a skilled professional service sector (attracted by tax incentives), not a manufacturing base. This has left the type 1 cities with a distinct legacy of technocratic governance, in which distributional issues and identarian concerns are downplayed in favor of managerial expertise – the primary responsibilities of mayors are seen as bringing in developers and keeping the city's fiscal house in order.

Likewise, the type 1 cities are marked by a significant degree of conflict with their state governments – they are solidly Democratic cities in the middle of red states, and historically they were not integral to their states' economies. As a result, the priorities of state and city government in type 1 cities often do not align. Finally, the type 1 cities also share a key geographic trait: they all had ample room to expand in their early years, aiding urban sprawl and highway-led growth.

Taken together, these traits laid the conditions for a vicious cycle of highway-led growth and social/political fragmentation in the type 1 cities, as I explored for the case of Columbus. However, Columbus differs notably from the other type 1 cities in one significant respect: The size of its black population (only 12%, according to the 2000 Census). This is not a refutation of my thesis; rather, it demonstrates that the extent of structural racism is more than just a function of demographic numbers. Some comparative scholars of the welfare state believe that there is a direct link between the ethnic diversity of a polity and the weakness of its social support systems; however, as the case of Columbus shows, the reality is more complex.

In Columbus, the mere *possibility* of a large black migrant influx in the early 20th century was enough to set off a wave of exclusionary zoning laws, even though the city did not attract nearly as many migrants (in absolute *or* proportional terms) as its neighbors Cleveland and Cincinnati. Indeed, the rhetorical strength of the (racially laden) urban/suburban divide is still strong today: I had multiple public officials from the wealthy suburb of Union County (including the County Commissioners) tell me they were reluctant to approve affordable housing construction or extended bus routes into their community because of the fear that these measures might attract the "riff-raff from Columbus". (Personal correspondence, 2015) Even if this supposed threat is much greater in reactionary voters' and politicians' minds than in reality, it still holds great influence over policy.

The takeaways from the case of Columbus, then, are twofold: First, when it comes to large-scale development efforts, city governments are highly constrained by county- and state-level institutions. It is for this reason that the former mayor of Atlanta and longtime transit advocate Shirley Franklin has turned

her attention toward state-level action, such as heading the creation of a statewide transit authority (the GRTA) and planning to sue the state government for over-reliance on automobile transit under the Clean Air Act. (Personal correspondence, 2015) Second, the political weight of racial categories does necessarily correspond to their actual size; structural expressions of racism are always shaped and magnified by their larger institutional context.

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Appendix: Factor Analysis

Factor analysis/correlation — Number of obs = 91
Method: principal factors — Retained factors = 3
Rotation: (unrotated) — Number of params = 27

Factor	Eigenvalue	Difference	Proportion	Cumulative
Factor1	2.57973	0.33954	0.5253	0.5253
Factor2	2.24019	1.64689	0.4562	0.9815
Factor3	0.59331	0.42247	0.1208	1.1023
Factor4	0.17084	0.09038	0.0348	1.1371
Factor5	0.08046	0.15096	0.0164	1.1535
Factor6	-0.07050	0.00930	-0.0144	1.1392
Factor7	-0.07980	0.09446	-0.0162	1.1229
Factor8	-0.17426	0.02048	-0.0355	1.0874
Factor9	-0.19474	0.03980	-0.0397	1.0478
Factor10	-0.23454	.	-0.0478	1.0000

LR test: independent vs. saturated: chi2(45) = 358.07 Prob>chi2 = 0.0000

Factor loadings (pattern matrix) and unique variances

Variable	Factor1	Factor2	Factor3	Uniqueness
e_rank_~8082	-0.5361	0.5744	0.0994	0.3728
cs_race_bla	0.6705	-0.5132	-0.1345	0.2689
cs_race~2000	0.6247	-0.0791	-0.0085	0.6035
cs00_seg_~25	0.6856	0.2475	-0.1751	0.4380
frac_trav~15	-0.7476	-0.0330	-0.2118	0.3951
hhinc_p~2007	0.4157	0.3910	0.3561	0.5475
subcty_~e_pc	0.1957	0.4342	0.2537	0.7088
coveragelow	0.0062	0.7123	0.1246	0.4771
servfreqlow	-0.4565	-0.6382	0.2578	0.3178
jobaccesslow	-0.0638	0.5676	-0.4654	0.4572